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OBSERVATIONS ON MANDIBULAR PROGNATHISM

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The interest which has recently developed in mouth abnormalities in bulls submitted for licensing invites some consideration of the genetical aspects. "Mouth abnormalities" is much too vague a term for this purpose. Defects of teeth and tongue have been reported as well as of the jaws and skull generally, so it is necessary to say at the outset that the discussion will be limited to defects involving the jaws. The term "undershot jaw" has been avoided as it has been used in two opposed senses—for the mandible which is too short relative to the upper jaw (Hancock, 1949), as well as for the mandible which is too long (Nordby, 1935; Miller & West, 1953). Part of this paper is devoted to a general review of the literature on the subject of variation in jaw length, and part to a study of this variation in samples of British cattle.

REVIEW OF LITERATURE

Nordby *et al.* (1945) have pointed out that it would be erroneous to assume that unequal jaw lengths arise only from variation in the length of the mandible. Mandibular prognathism could arise from a shortening of the upper jaw as well as from a lengthening of the lower. Indeed both, theoretically at least, could be abnormal for a given breed and result in either correct or incorrect dental occlusion. What is normal for one breed of sheep may, according to Hitchin (1948), be abnormal for another. Although perhaps not obviously true of sheep, the sentiment certainly applies to pigs and dogs, some breeds of which are characteristically prognathic, while others have relatively light short mandibles. Evidence of a considerable degree of developmental independence of upper and lower jaws is not far to seek. Long-nosed dogs, such as show collies and greyhounds, are prone to short lower jaws (Miller & West, 1953). Crosses between long-nosed and short-nosed dogs carried out by Stockard (1941) showed that the growth of upper and lower jaws was often imperfectly co-ordinated. The implication is that some at least of the genes affecting the length of the lower jaw act independently of those controlling the length of the upper jaw.

In cattle, single genes can bring about inequality. Darwin (1882) described the niata cattle of South America which probably had been bred homozygous for a gene achieving such a marked reduction in the nasal and premaxillary bones that the incisor teeth jutted outwards and upwards in ludicrous fashion. To save the animals in time of drought, they had to be hand-fed because they were ill-adapted to browsing on trees and shrubs which sufficed for normal cattle.

Becker & Arnold (1949) describe a family of grade Jersey cattle in which occurred individuals, apparently homozygous for a recessive gene, with short broad heads, shortened nasal bones and prominent prognathic lower jaws showing an excessive upward curvature like the skull of a niata animal illustrated by Vasey (1857) and reminiscent of the head of a "bulldog" Dexter calf. Surrarer (1943) refers to three similar cases in Jerseys. Various degrees of inherited achondroplasia involving skull proportions have been reported and reviewed by Gilmore (1949). Agnathia has been reported by Heizer & Hervey (1937) and Annett (1939), and listed by Lerner (1944) as characters A14 and A19. Ranstead (1946) thinks both are due to the same recessive gene. Ljutikov (quoted by Lerner, 1944) reported the occurrence of short-legged calves with lower jaws too short to permit of grazing, and Ely *et al.* (1939) described foetal calves without lower jaws.

More recently, a form of dwarfism in Hereford cattle has been described by Johnson *et al.* (1950) which may be relevant to the problem of prognathism in British beef breeds. Their data suggested that the dwarfs were homozygous for a recessive gene, and that heterozygotes, although apparently normal, might be favoured for breeding purposes because they come nearer to the ideal conformation than do homozygous normals. Gregory *et al.* (1951) confirm the hypothesis of a recessive gene, and assert that homozygous dwarfs as calves have body proportions rather like those of a mature normal beast. They often breathe heavily as if the respiratory passage were obstructed, their heads are short and wide (brachycephalic), and nearly all show a protruding lower jaw with incisor teeth that miss the dental pad by 1½ to 3½ cm. A bulging forehead and a misshapen mandible are characteristic (Gregory *et al.*, 1951). All these features recall hereditary cretinism, and the dwarfs are claimed in fact to be deficient in thyrotrophic pituitary hormone (Carroll *et al.*, 1951), although Johnson *et al.* (1950) stated that the thyroid gland was active. In later papers, Gregory and his co-workers (1952, 1953) show that heterozygotes may be distinguished by their head profiles and state that, owing to preference by breeders for them, the dwarf problem has reached serious economic proportions. Unfortunately, no mention is made of the lower jaw in heterozygotes. No evidence of the occurrence of such dwarfs in British beef cattle appears to have been published, but it is clearly of considerable interest to know whether or not they do occur.

The most extensive and careful study on jaw inequalities seems to have been carried out by Nordby *et al.* (1945) on sheep. They were able to show that sheep deficient in length of lower jaw had longer skulls and shorter mandibles than normal sheep. Only minor degrees of inequality were compensated for by the angle of emergence of the incisor teeth so that the teeth continued to meet the dental pad. If the incisor teeth did not meet the pad, some factor other than pressure by it determined the angle. At the age of weaning affected lambs were no more variable in weight than normals, but significantly lighter. Some animals changed in grading for jaw length with age, but the change was not always for the better and the authors make no generalisations. Genetically, the short lower jaw condition did not turn out to be simple. Several pairs of genes were probably involved, and some at least were dominant in action. Supporting evidence that heredity can account for short lower jaws in sheep is given by Young & Purser (1954) who found four seriously affected weaned lambs in a flock of 140 composed of seven breeds and crosses. All four were Scotch Blackfaces from one of two contributing stocks, and all died.

Both anatomically and genetically, the normal matching of jaw lengths is complicated. Failure to achieve it could theoretically arise from (*a*) foetal and post-natal malnutrition (cf. Warkany & Nelson, 1941 ; Franklin, 1950) ; (*b*) developmental accident ; (*c*) one gene of recognisable effect acting predominantly on one or other jaw ; or (*d*) two or more non-allelic genes causing developmental disharmony. It is not necessary to suppose in all cases that the causative genes act specifically on jaw length. They may induce a lack of stability in development which makes the skull bones in general, and the jaw bones in particular, more than usually sensitive to environmental influences (Nordby *et al.*, 1945). Wright's (1934) study of otocephaly in guinea-pigs deals with a similar situation.

Thyroid deficiency, induced by thyroidectomy, affects skull proportions. Liddell (1925) and Todd & Wharton (1934) noted in experimental sheep a shortening of the upper jaw and prognathism of the lower. In pigs, Dye & Maughan (1929) observed relatively wide skulls after thyroidectomy, but the effects on the mandible were not consistent. Brachycephaly, according to Dye & Kinder (1934), is associated with shortened maxillary bones and changes in the shape of the nose. These characteristics would result from hypothyroidism, but no evidence was found that a short mandible is either the cause or an effect of brachycephaly. Parsons (1924), however, states that short skulls are usually more prognathic than long ones. In the light of these reports it is interesting to speculate on the possibility that the short wide heads and the short-legged blocky conformation sought for by breeders of beef cattle have been achieved at the cost of a reduction in thyroid gland activity.

Results of Grading for Jaw Length in Two Herds

Since data on the incidence of jaw inequalities in British cattle have not hitherto been available, an examination has been made by Mr. D. Anderson and Mr. H. Williams of 459 unselected animals of various breeds and crosses, all pail-fed as calves. For the purpose, a scale was drawn up by which the animals could be classified. When the edges of the central incisors met the anterior angle of the dental pad, the grading was O. For each 0·1 inch by which the teeth projected beyond the pad with mouth closed, 1 was added so that an animal classed as +3 showed a gap of 0·3 inch and so on. For short lower jaws the same scale with negative numbers and starting from the same zero position was applied. No measuring device was used so that the gradings are only estimates, but drawings were available to guide judgment.

A summary of results is given in Table 1. The dairy breeds and crosses referred to were Ayrshire, Friesian and Jersey, and their reciprocal crosses ; the Shorthorn group contained non-pedigree Shorthorns from the West Midland dairying area, and various shorthorn crosses mostly by Ayrshire or Friesian bulls ; the beef crosses were mostly by Hereford and Aberdeen Angus bulls out of Shorthorn or Friesian cross cows. No pure Herefords are included.

Analysis of the detailed figures showed no significant difference between the two distributions for temporary and permanent teeth. Comparison is, of course, vitiated by the fact that the gradings were made on animals of varying size and age. It is not known whether a grading can change as growth proceeds nor whether, if there is change, it is for better or worse. The close resemblance, however, of the distributions for temporary and permanent teeth suggest either that there is little change, or that improvements are balanced by deteriorations.

It can be seen from the data that the dairy breeds and crosses produced only 11 animals out of 325, or 3·3 per cent. which had gradings of ±2 or more. In the Shorthorn group and in the beef crosses, the incidence was greater (13 and 14 per cent.). Statistical tests showed that the distributions for Ayrshires and Friesians and their crosses were significantly different from those for Shorthorn and Hereford crosses. The samples of animals studied were, unfortunately, neither large nor representative of pure-bred dairy Shorthorns or beef breeds, and consequently the data merely suggest that a wider survey might reveal a comparatively high frequency of prognathic animals in some breeds or among the progeny of certain beef bulls.

In all three groups of Table I, it will be noticed, the distributions tend to be positively skew about the mode of grade O, that is, most of the aberrations in jaw length result in plus gradings. The majority of these aberrations probably cause little trouble in grazing for the pad bears upon the posterior surface of the incisor teeth. Distributions such as those shown could be the outcome of a combination of (*a*) errors of observation of the order of one grade ; (*b*) developmental accidents of no genetical significance ; and (*c*) genetic variation. In the light of published data, and of the breed differences shown in Table I, it may reasonably be assumed that genetic variation occurs, but it is not clear whether it

Table I

Position of Incisors in Relation to Pad. Animals with Milk Teeth Only are Classed Under "Temporary," and Older Animals Under "Permanent."

	Grading									
	−3	−2	−1	0	+1	+2	+3	+4	+5	+6	Total
Dairy Breeds and crosses (excl. Shorthorn)											
temporary	1	—	11	113	34	6	1	—	—	—	166
permanent	1	—	8	99	49	2	—	—	—	—	159
Shorthorns and crosses with dairy breeds											
temporary	—	—	1	23	19	2	—	—	—	—	45
permanent	—	1	—	14	14	5	2	—	—	1	37
Beef breeds and crosses											
temporary	—	—	2	14	11	4	1	1	—	—	33
permanent	—	—	1	12	5	1	—	—	—	—	19
Totals :—											
temporary	1	—	14	150	64	12	2	1	—	—	244
permanent	1	1	9	125	68	8	2	—	—	1	215
Total	2	1	23	275	132	20	4	1	—	1	459

accounts for one or both of the extreme types or for at least a proportion of all deviations. The practical value of knowing which alternative is correct would come from being able to decide whether any discrimination that is to be practised should be against one or both extremes (say Grade 3 or worse) or, as far as possible, against all deviations.

Included in Table I were 42 pairs of one-egg twins. Of these, 16 showed intra-pair differences of one grade, and none showed greater differences. As the gradings are subjective, it is probably safe to conclude that all were concordant. Thirty-seven pairs fell within the range −1 to +1. Only one of 39 pairs of two-egg twins differed by more than one grade and this pair was +1, +3. Among 19 pairs of contemporary single-born calves equivalent to two-egg twins in relationship one pair was discordant (+1, +3), and among six pairs of half sisters one pair was discordant (−1, +2). Such differences as there were within pairs occurred where they would be expected if heredity were responsible, but obviously no conclusions can be drawn from such meagre results.

Since measurements of head length and width have been recorded on the animals in Table I, it has been possible to enquire whether these differ in any obvious way from normal for animals with extreme gradings. Normal heifers regardless of breed appear to go through a stage as calves when the ratio of head width to length is about 1 : 2. Thereafter, until growth ceases, the specific growth rate of head length is consistently greater than that of head width, so that the ratio widens (cf. Kidwell, 1952). Individual and breed differences, no doubt, determine how far this process goes, and thus the final relation of width to length. Hereford crosses, for instance, showed a ratio of about 1 : 2·2 while Friesian type cows showed one of about 1 : 2·4. The two-and-a-quarter-year-old steer with the grading +6 was much below normal in size and weight, and had for its age a rather short head. For its weight, however, the ratio of width and length was not exceptional. Other animals with smaller gradings also appeared normal in this respect but they were too young to show their final head shape.

Owing to the variation among animals and to errors of measurement it is not profitable to consider particular cases. To test the idea that mandibular prognathism might be due wholly or in part to successful selection for short and relatively wide heads would require more data from purebred animals with a range of jaw gradings than are presently available.

Discussion

Although neither the nature nor the degree of genetical control of prognathism in cattle generally, or in British beef cattle in particular, is known, the reports cited above give grounds for believing that heredity may be found to play an important part. From the point of view of bull licensing the mode of inheritance will be of some significance. A simple dominant condition would make selection through licensing effective. A simple recessive condition would also make it effective, but to a degree dependent on gene frequency. In the likely event of inheritance being more complicated the outcome would depend on heritability, and stringency and direction of selection.

Confirmation that prognathism in cattle is to a greater or lesser degree inherited is not in itself sufficient for a rational approach to culling. Examined in adequate detail, most characters would be found heritable to some degree, but it is clearly impossible to select for favourable variants in every direction. Some assessment has to be made of relative importance. As far as prognathism is concerned, it may be taken for granted that extremes are undesirable and upon this might be founded the working and workable principle that all deviations from normal, whether disadvantageous in themselves or not, should be discouraged. The ground for this would be that animals showing deviations are more likely to beget one or more offspring with an undesirable degree of malocclusion than are normal animals. The adoption of this principle, however, entails certain difficulties. First of all, there must be a definition of "normal"—a problem which may involve a conflict between currently accepted breed characters and anatomical considerations. Secondly, there is the dubious assumption that abnormal jaws are of such importance that selection against them must take precedence over other considerations of conformation and performance. Such precedence would arise from applying fixed standards at any stage of selection, including licensing age. Finally, there is the question whether a character that would be objectionable in a breed normally bred pure is acceptable in breeds specialising in the production of sires for crossing if it disappears or is reduced in the crossbreds. These difficulties are not specific to prognathism. Along with others, they apply even more acutely to other traits considered at the licensing age for which there is even less genetical justification. While it is encouraging, therefore, to learn (*The Veterinary Record*, 1954) that there is to be an official investigation of the extent to which jaw abnormalities are inherited, the adoption of a similar factual approach to the whole principle of licensing would be much more satisfactory.

Summary

There is evidence in the literature relating to jaw abnormalities of inherited variation, but the hereditary basis is not always of a simple Mendelian type. A survey has been made of the incidence and degree of prognathism in 459 dairy and beef type cattle. In the sample of animals available, dairy type stock was less affected than beef type stock. The genetical aspects of the problem are discussed in relation to bull licensing.

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(*Continued overleaf at foot of Col.* 1)

CRYPTORCHIDISM WITH SPECIAL REFERENCE TO THE CONDITION IN THE DOG

Prepared by The Technical Development Committee

In many domestic animals (horse, ox, sheep and pig) the descent of the testes into the scrotum is generally completed by the time of birth but in the dog, while they are mostly present in the scrotum at birth, in some dogs they do not descend until a week or so after birth (Härtl, Whitney). Cryptorchidism is a developmental defect characterised by the failure of one (unilateral cryptorchidism) or both (bilateral cryptorchidism) testes to descend to their normal position in the scrotum. Monorchidism, strictly speaking, refers to the presence of only one testis in the animal but it is often used to denote the presence of only one testis in the scrotum : this latter condition is actually one of unilateral cryptorchidism. In domestic animals, cryptorchidism may be complete or incomplete. According to the position of the testis, the condition may be abdominal (complete if all the testis and its appendages are in the abdomen, incomplete if part of the appendages are in the inguinal canal) or inguinal cryptorchidism. The condition in which the testis lies outside the scrotum but external to the inguinal ring is normally called ectopia testis.

Occurrence

The condition of cryptorchidism occurs in all domestic species but has been said to occur most often in dogs (Härtl). Kraus (cit. Whitney) estimated the number of cryptorchid dogs as between 0·05 and 0·1 per cent. It occurs commonly also in horses and pigs—Lush & Jones suggest it is perhaps a little commoner in pigs than in horses, maybe reaching 1 to 2 per cent. of live births. Härtl also says the condition is common in the silver fox and sheep : Lush & Jones, however, regard it as rare in sheep except in polled Merino strains. The condition is less common in the cat and goat (Härtl) except that it is quite common in Angora goats—Lush & Jones found an incidence of 54 per 1,000 live births in the Texas Station herd. The condition has also been reported in the camel, donkey, deer and lion and in man the incidence has been estimated as 25 per 10,000 males (Lush & Jones).

Symptoms

In the horse, abnormal sexual excitement may be noted, and nervousness. In the ram (Härtl), there is often change of temperament and deficient sexual instinct. In the pig, of 10 cryptorchid boars (five being double cryptorchids), only one (McKenzie) failed to develop masculine characters—this boar had one testis only, which lay in the inguinal canal. If the boar is a unilateral cryptorchid and the scrotal testis is removed (Anon., 1931), the boars become as barrows, with a total loss of sex instinct, and apparently only a very small percentage of cryptorchid pigs from which the normal testis has been removed develop a sexual odour in the carcase, particularly if the pigs are marketed at around six months of age (Nordby). The castration of cryptorchid pigs involves some risk. In the Angora goat (Lush & Jones) the retained testis is always abdominal ; the right testis is always affected and sometimes the left as well. In the dog, the condition makes for unreliable dispositions (Whitney), disturbed psyche, nervousness, or increased fat deposition and eunuchoid characteristics (Härtl). The retained testis is said to be more liable to become affected with tumours (Whitney). This applies particularly to the Sertoli cell tumour : of a series of 35 such tumours from dogs examined at the Royal Veterinary College, London, at least 20 were in ectopic testes, 11 being situated in the inguinal canal, and one in the abdomen.

Effect on Fertility

McPhee & Buckley found that bilateral cryptorchid pigs might produce viable germ cells and they thought that this might be due to an unobserved temporary descent of the testes from the warm environment in the abdomen, or to some temperature effect, the successful matings having occurred in cold weather. The retained testis shows atrophy of spermatogenic cells (McPhee & Buckley) and a bilateral cryptorchid would be expected to be sterile.

Nordby had under observation a family of cryptorchid dogs —two unilateral and two bilateral—one of the unilateral cryptorchids being the father of the other three dogs. Härtl says Haberland found the retained testes to be anatomically and histologically normal and showing spermatogenesis, but Schlotthauer and Bollmann produced unilateral and bilateral cryptorchidism experimentally in dogs and found tubular atrophy of the testes, although the interstitial cells appeared to be unaffected.

Whitney states that dogs with both testes retained in the abdomen are always sterile but may become fertile if the testis is brought out of the abdomen surgically, with return of sterility if the testis is replaced in the abdomen.

Breed Incidence in the Dog

Koch (1935) found the cryptorchid common in dwarf breeds and in breeds characterised by shortened skulls. German Shepherds are also affected, and Kaschny (cit. Härtl) divides this breed into six families, one of which is free from cryptorchidism, while the others show a more or less marked tendency to cryptorchidism. Härtl found most of the German Boxers some 20 years ago to have a tendency to cryptorchidism, and cryptorchidism was found to be particularly prevalent in Boxers in a region of America (Whitney). German Spaniels were rarely affected but the condition affected seven male pups in three litters from one bitch (Koch, 1938). In England, the condition has been encountered in at least the following : Boxers, Poodles, Pomeranians, Cocker Spaniels, Alsatians, Corgis, Sealyhams, Dachshunds, Shetland Sheepdogs, Chow Chows, Whippets and cross-bred. Burns suggests there is no evidence that cryptorchidism is any more frequent in breeds in which the matter has been totally ignored than in those breeds in which it has received so much attention.

Hereditary and Familial Incidence

Cryptorchidism has been said to be hereditary in the horse, due to a dominant factor, and in the pig, dog and sheep due to a recessive factor (Couvreux). In the pig, the evidence suggests that the condition is hereditary (McKenzie) (although non-hereditary cases occur), and depends on a single recessive factor (Korovetzkaya), and there is some evidence from breeding experiments in support of this (McPhee & Buckley). In the Angora goat, Lush & Jones suggested that the condition was recessive.

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In the dog, Whitney stated that cryptorchidism ran strongly in families, *e.g.*, of Boxers, and bitches were able to pass on the propensity. The condition has been investigated in German Boxers by Koch & Härtl ; their studies appear to have been made at the request of the breeders and are mainly concerned with the Boxer breed. Their material consisted of breeders' records for Bavaria and other parts of Germany. Härtl studied 29 affected litters, and 28 normal litters from one establishment in Bavaria ; of 168 male pups reared, 39 (23 per cent.) were cryptorchid (nearly one in four) ; when 55 litters that contained cryptorchids only were considered, the proportion was 36 per cent. Seven of these litters showed all the male pups to be affected (one litter with three, one with two, five with one, male pups). The data were examined for evidence of a dominant factor being concerned, but it was considered that the evidence pointed to a simple recessive factor. In the case of females in their study, it was found that they belonged to four families, the four foundation sires of which appeared in the pedigrees of nearly all German Boxers at that time. Koch (1938), as stated above, found seven pups affected in three litters from one bitch : the father of two of the litters was a litter mate of the mother, and the father of the third litter had a brother (not a litter mate) which was itself affected. The breeders' association agreed to Koch's suggestion that all the animals of these families be prevented from breeding.

Young writes : " It is unlikely that bilateral cryptorchidism would, by itself, increase rapidly, since affected animals are probably always sterile. Unilateral cryptorchidism would be likely to increase only where it was deliberately selected for, or much more likely, where it had got into some studs at the top of the breed and was being selected for unconsciously because of the good qualities in that stud. Indeed, it might even be possible that pleiotropic or side effects of the gene or genes responsible were favourable, and the selection for these side effects was the cause of the condition spreading in the stud. In either of the latter two cases, the breeders would have to make up their minds whether they valued the associated good qualities sufficiently highly to put up with the ill effects of cryptorchidism. When a private breeder desires to reduce the frequency in his own stock, the procedure would be not to use unilateral cryptorchid sires . . . and . . . to refrain from breeding from sires, dams and sibs of the affected animals.

Showing

Whitney says that cryptorchids cannot be shown in America, as, if the judge sees the defect, he may disqualify the animal. In Germany, since 1935 (Härtl), unilateral and bilateral cryptorchids may not be shown. Young writes : " It would probably not be reasonable to lay down that a cryptorchid dog should never be used. On the other hand, it would seem reasonable that a cryptorchid dog should be heavily weighted against, both in showing and breeding."

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Report of the Departmental Committee on Foot-and-Mouth Disease

The Report of the Departmental Committee on Foot-and-Mouth Disease, 1952–54, of which a summary of the Conclusions and Recommendations was given in our issue of July 31st, is a most interesting and important document. The Committee, under the Chairmanship of Sir Ernest Gowers, G.B.E., K.C.B., visited a number of European countries and the Argentine and considered evidence from more than 90 bodies, associations and individuals in this country. It is to be congratulated on the energy with which it has carried out its task and on the amount of valuable information which it has been able to include in its Report.

The Report consists of 78 pages of text, six pages of Summary and 16 Appendices which cover a further 67 pages. The text is arranged in five chapters which call for detailed consideration. The Appendices include a list of bodies and individuals who submitted evidence, a short paper by Dr. W. M. Henderson on " The Nature of Foot-and-Mouth Disease," graphs and maps showing outbreaks in Great Britain, an excellent account of the 1951–52 outbreaks in Great Britain, three notes on the possible significance of birds as agents in the introduction of virus into this country, copies of orders of the Ministry of Agriculture and Fisheries bearing on control of the disease, the constitution of the European Commission for the Control of Foot-and Mouth Disease, an estimate of the costs of vaccination for comparison with the actual cost of stamping out, and finally a summary of a memorandum on " Immunity to Foot-and-Mouth-Disease " submitted by Dr. I. A. Galloway.

The first chapter of the text of the Report proper is entitled " The Nature and Incidence of Foot-and-Mouth Disease." That portion covering the effects of the disease contains nothing that is not known to members of our profession, but the table comparing the numbers of outbreaks each year from 1929–53 in certain European countries may be cited as the type of information to be found in this publication which is not readily obtainable elsewhere. Particular attention is paid to the history of the disease in this country.

In its second chapter, " Causes of Primary Outbreaks in Great Britain and Precautions against Them," the Committee considers in detail the origin of our outbreaks since April, 1938, when the State Veterinary Service came into being. Of the 540 primary outbreaks, 16 per cent. were attributed by the

Ministry to birds, 40 per cent. to swill, 9 per cent. to contact with imported meat and bones other than swill, 7 per cent. were of unknown origin but possibly connected with swill, etc., and 28 per cent. were of " origin completely obscure." The Committee, following the 1924 Committee, then divides the causes into " Uncontrollable " and Controllable Causes," which are discussed in great detail. The two uncontrollable agents are birds and wind. Of the birds which may be of importance, the case against the starling is " formidable but it has not been proved." Whilst there is no evidence to incriminate gulls they must be considered possible agents by which the disease could be introduced. Reasons are given why racing pigeons are unlikely to be a source of danger. No conclusion is formed on the possible introduction of infection by wind. Windborne infection from Denmark is believed in Norway and Sweden to be the cause of outbreaks. The distance across the Channel is greater and the weight of scientific opinion is against the survival of virus exposed to sunlight for the period necessary for small particles of saliva to be carried across. Introduction of virus in this way might be possible at night during cold weather.

Of controllable sources of infection the present measures to prevent the importation of live animals, hay and straw and vegetables are considered satisfactory, and the Committee does not think that the risk is sufficient to warrant disinfection of persons and motor vehicles arriving from the Continent. The Committee, however, devotes six pages to the consideration of chilled and frozen meat imported from South American countries in which foot-and-mouth disease is endemic. Attention is drawn to recent research at Pirbright which has demonstrated the viability of the virus in bone-marrow and lymph nodes for periods longer than had previously been supposed. If the outbreaks of 1951–52 are omitted, the percentage of primary outbreaks in Great Britain probably due to swill rises to over 70. Investigations on the spot into the working of the control measures under the " Bledisloe Agreement of 1928 " revealed that in spite of the goodwill of the Argentinian authorities, shortage of veterinary officers caused some risk from animals that might be slaughtered whilst incubating the disease. It is therefore necessary to ensure that efficient steps are taken in Great Britain to prevent unsterilised swill being fed to pigs and to prevent meat waste products being dumped where susceptible animals may have access to them or where dogs, rats and birds may pick up portions and carry them into contact with such animals. The difficulty of enforcing the Boiling of Foodstuffs Order, 1927, is stressed. Attention is drawn to the " wartime " efforts made to conserve kitchen waste as animal foodstuff and the anomalous situation that arose when private collectors of swill had to be licensed only in areas where local authorities themselves collected kitchen waste. Although the Agriculture (Miscellaneous Provisions) Act, recently passed, empowers local authorities to collect waste, it does not compel them to do so and, since many lost money during the war over this activity, compulsion would be unrealistic. The Committee considers that it would be ideal if all collectors were licensed and compelled to sterilise swill. The licensing of small collectors, whoever was responsible for licensing, would be unwieldy and difficulty arises in drawing a line between small and large collectors. The Committee concludes that all local authorities should be empowered but not compelled to salvage waste food, that all collectors, large and small, should be compelled to sterilise waste food, that all " substantial " collectors should be required to obtain a licence imposing an obligation to use an approved sterilising plant which should be inspected periodically and that the question should be considered of assigning to local authorities the task of licensing collectors and inspecting boilers and plants.

With regard to the dumping of animal refuse, the law should be amended and steps taken to ensure the disposal of such refuse so that it is not a danger to animals.

Methods of Combating the Disease

The third chapter is headed " Methods of Combating the Disease." In it are considered stamping out, vaccination, combinations of the two and international action. The methods adopted in a number of countries are described and the results claimed are given. No similar appreciation of the subject is available and the chapter is a most important comparison of existing methods in Great Britain with those used in several European and American countries. The information is summarised and is, therefore, not suitable for further condensation. It emphasises the desirability for international action and leads directly to consideration of the European Commission for the Control of Foot-and-Mouth Disease. This body is designed to co-ordinate and extend the present work in respect of the disease of the Office International des Epizooties, the Food and Agriculture Organisation of the United Nations and the Organisation for European Economic Co-operation. Unfortunately, there has been delay in inaugurating the Commission. The Constitution of the Commission was approved by the Seventh Conference of the F.A.O. on December 11th, 1953 ; but it does not enter into force until six member nations of the F.A.O. or the O.I.E. have formally deposited notification of acceptance. At the time that the Report was written only five had accepted and disappointment is expressed that progress is so slow [the Commission has recently met in Rome and Sir Thomas Dalling has been appointed Secretary]. The proposed functions of the Commission are the dissemination as quickly as possible of information in the occurrence of, extent of and type of virus present in outbreaks [work already covered by the O.I.E.], arrangement of facilities for typing strains of virus, arrangement for production and storage of vaccines, provision of technical advice and stimulation of research work.

The terms of reference of the Committee instructed it to review the policy and arrangements for dealing with the disease in Great Britain. Chapter IV is concerned with " Policy " and Chapter V with " Arrangements " to this end.

The majority of British witnesses emphasised the need to continue, in present circumstances, the stamping-out policy. Some considered it ideal, others thought it a " deplorable necessity " until a better method could be found. A few contended that it might have been dropped already had more vigorous efforts been made to find an alternative.

During visits abroad the Committee was impressed with the view expressed in countries where vaccination is practised at present, that stamping out should be adopted once outbreaks were reduced in numbers to the point where it would be practicable. A proper consideration of an alternative policy of general vaccination shows that to be effective it would necessitate the vaccination of every bovine three times a year against a number of strains of virus. Vaccination of sheep and pigs with present vaccines is generally believed to be of little value. The cost of this would be quite uneconomic even were it a practical proposition and a policy of general vaccination might interfere with the export of pedigree stock. In normal years, Ring vaccination, as practised in Sweden and Switzerland to contain outbreaks, could not be justified because of the low frequency of secondaries occurring during the period beginning 14 days after the primary within a radius of 15 miles. Immunity takes 14 days to develop and a ring of 15-mile radius contains on the average 275,000 animals. To vaccinate this number of animals in a normal year, even if vaccination of sheep and pigs were effective, would reduce the total number of secondaries by a maximum of 21 per cent.

In actual fact the reduction would be considerably less and the Committee does not, therefore, think that Ring vaccination can be justified. Frontier vaccination is used in Sweden and some other countries. So far as Great Britain is concerned it would be of no value in normal years. The position may be different when, as in the 1951–52 outbreak in Europe, there is a massive build-up of infection across the Channel and North Sea. Assuming that there is no inherent objection to vaccination, it may then be helpful to vaccinate cattle along the coasts of Kent and Sussex; but whether it would be worth while could only be determined " in the light of circumstances as they arise."

Vaccination of Selected Herds

In Sweden, also, when infection is present or threatens, vaccination of selected valuable herds is practised. Should infection occur in these herds they are not slaughtered (as are other infected herds), but a quarantine is imposed and the disease is allowed to run its course. The cattle population of Sweden is less dense than that of Great Britain and the risk in allowing an outbreak to run its course is less than in this country. The Committee thinks that it would be inadvisable to run the risk of allowing infection to persist in a herd and points out other differences between the position in Sweden and this country. For example, Sweden is infected from Denmark and the type of virus is usually known in advance. The paramount question in this country is checking the spread of the disease, and the action to be taken should be guided by this rather than by what herds are best worth protecting against the risk of their becoming infected.

The voluntary vaccination of cattle by those farmers who wish to do it is also considered by the Committee. It finds that there is no general demand for this and cites a number of objections to permitting it. The most significant of these is the widely-held scientific opinion that vaccination might lead to masked infection and the spread of the disease by animals having it in a sub-clinical form. The Committee cannot assess the additional risk that this would entail; but they do not think that voluntary vaccination should be permitted until accurate information on this point is available. Vaccinated cattle may not be imported into the United States and Canada, and Australia and New Zealand might refuse importations from this country were any type of vaccination permitted.

The Committee draws attention to the extent and value of the work on vaccines that has been done at Pirbright and recommends that that Institute be enlarged so that it can produce vaccine in quantity sufficient to deal with the situation should at any time the present system of control by stamping out break down. It does not consider it possible to " define beforehand the state of affairs which would justify recourse to organised vaccination. Limited frontier vaccination might be advisable in the event of extensive infection of the coast across the Channel and circumstances might arise when Ring vaccination might be advantageous. The Committee admits that it would always be easier to be wiser after the event than to decide in time when such a course would be justified.

In its final chapter the Committee discusses what can be learnt from the recent severe invasion of 1951–52. This invasion occurred in three phases, the Eastern outbreaks, the Southern outbreaks and the final group in Cheshire, the Midlands, Wales and Scotland. During the first two phases the invasion was resisted " with no small success." In the third group, six primaries lead to no fewer than 290 secondaries, and since five of the primaries may, in fact, have been secondaries, it is clear that if the outbreak at Checkley had been effectively confined, half the outbreaks of the 1951–52 episode would have been prevented. The primary reason for the spread from the primary was failure to recognise and report this outbreak. Two subsidiary causes were that calves *en route* to Scotland were fed at Crewe with milk which came from herds in which the disease was diagnosed a day or two later, and that meat from slaughtered in-contacts in Wigtownshire was salvaged and scraps of it eventually found their way in unboiled swill to a piggery in Dumfriesshire. Spread may also have occurred through human contacts, milk, churns, churn washings, milk lorries and cattle lorries that had not been properly disinfected. The Committee makes a number of recommendations which it thinks may help to prevent a recurrence of such a happening, and in a general survey of regulations considers some restrictions which various witnesses held to be onerous.

Radius of Infected Areas

After examining the number of secondaries that have occurred more than 10 and less than 15 miles from the centre of an outbreak, the Committee suggests that the reduction of the radius of an Infected Area from 15 to 10 miles would be justified. This would reduce the present area of 700 square miles to about half. The vital importance of not permitting any unnecessary movement from the Infected Place is emphasised and it is thought that the Ministry's veterinary officers should have power to close roads and footpaths in an Infected Area. Main roads, at least, should be well signposted so that strangers can recognise the beginning of an Area. In view of the increased use of artificial insemination and the hardship that follows prolonged restriction of this service, it is considered that veterinary officers should be instructed to permit inseminators to visit farms in an Infected Area as soon as they think that this can be done without undue risk. Hardship to the farmer should be emphasised rather than complete absence of danger.

The Ministry's present attitude to Controlled Areas is endorsed. In order to facilitate the issue of movement licences, the Committee recommends that policemen should be appointed Inspectors under the Act by all local authorities and that all Inspectors should be supplied with an up-to-date handbook of instructions. From the foot-and-mouth disease aspect the creation of independent control in Scotland would not be a wise step Milk lorries should not enter farms in an Infected Area to collect churns These should be placed on ramps on the roadside for collection. Churn washings, etc., from dairies drawing milk from farms in an Infected Area should be heat-treated before being allowed to leave the premises. Unsterilised offal should at no time be permitted as fertiliser. It is recommended that cattle should not be moved a second time within six days of a prior movement, except for slaughter. The feeding of milk to calves in transit by passenger train is not considered necessary and it should be prohibited. A good water supply and power pumps to facilitate cleaning of vehicles should be installed at all markets, and local authorities might consider equipping fire-stations with the necessary apparatus to enable them to help in the disinfection of farms. The Committee regretfully comes to the conclusion that slaughtering of in-contacts on the farm is necessary. Reversion to the system of disposal of carcases by cremation should be effected if this is economically feasible and the salvage of meat from apparently-healthy animals should be discontinued.

The Committee stresses the need for better propaganda and education on foot-and-mouth disease. Every effort should be made to publicise the location of outbreaks in the Press and through the B.B.C. Veterinary surgeons practising in an Infected Area should be notified by telegram or telephone.

Information on the nature of the disease should be disseminated and farmers constantly educated on the subject. Posters and films illustrating the dangers of spreading the disease should be available for exhibition in and around Infected Areas. Special attention should be given to the education of veterinary surgeons. The preparation at Pirbright of a coloured film for showing to students and the profession is suggested. Since the diagnosis of foot-and-mouth disease is sometimes difficult, *all* cases of sickness in ruminants and swine in an Infected Area should be reported and the maximum penalty for failure to report should be increased. Compensation, as at present, should be limited to the value of the animals slaughtered. No change in the action taken in regard to Agricultural Shows is recommended.

In the final two paragraphs the Committee considers the Ministry's veterinary staff. It finds no reason to believe that conditions exist which prevent the Ministry from recruiting the best type of officer. The Ministry might consider a reduction in temporary and an increase in permanent staff. The Committee was impressed with the magnitude of the responsibility of the officer in charge of an outbreak and suggests that conditions should be such as to ensure that men of the highest possible calibre are attracted.

The amount of detail in this Report has resulted in a rather lengthy and, in parts, a disjointed abstract. The reviewer does not feel that he has done justice to the Committee, and would urge all members of our profession to study this important publication for themselves.

J. R. H.

"OFF THE HOOK"

Readers of *The Lancet* will be familiar with the delightful series of articles which appear each week under the heading "The Widdicombe File." In the issue of August 14th the current article, under the heading above, dealt with the matter of veterinarians and meat inspection. By kind permission of the Editor of *The Lancet* we re-publish it herewith.

My Dear and Venerated Cobbleigh,

This will never do. You have put your foot in it—right up to the hock. Knowing your devotion to the agoraphobic principles of the Gallio Society I cannot believe that you have any personal share in this enormity, but you must bear your part of the blame which attaches to the corporate hoof of the Society of Medical Officers of Health. Seldom have I been so cross as when I had read the medical manifesto in answer to the proposal of our veterinary colleagues that responsibility for meat inspection should fall on them.* I am sure that I am mistaken, but it reads like the stick-in-the-mud assumption of entrenched and self-satisfied bumbledom that all is for the best in the best of all possible abattoirs.

> ". . . the fundamental purpose of meat inspection is to safeguard the health of the individual consumer."

Aye, true enough, and the chlorination of our water and the sweeping of the streets are intended to safeguard the health of the individual drinker and the individual breather. Do you manage the waterworks or the cleaning department? The claim that the M.O.H. should be in charge of all those activities of his authority which bear upon the public health is sound after-dinner oratory, but it lapsed 50 years ago. Perfection in your branch of our profession demands the polymathic gifts of Solomon, Hippocrates, Sydenham, Budd, and Dr. Arnold—but not the knowledge of which tap to turn and which gauge to read in the filter-house. Those exacting duties are left to an engineer, who protects us quite successfully from enteric fever even though he may think that Salmonella is the name of a race-horse (by Salmon Trout).

Your collective error has arisen, I think, because it is many years since you considered what is the essential nature of meat inspection. It is not something done only to satisfy the Health Committee. It is not a matter of sampling milk or seeing flies on the black puddings or mould in a jam roll. It is the *ante-* and *post-mortem* detection of disease. If the layman's wife or his dog vomits blood he is entitled to make any diagnosis that folklore or the popular Press may suggest to him, but for a rational explanation of his family misfortune he turns to Bill Brewer or our veterinary colleague. The latter thinks as little of the layman's guesses as we do, and for the same reason—that he alone has been trained in his art on a logical and comprehensive plan. Neither he nor Bill escape error invariably, but they retain the confidence of their customers and no one could ask for more. School inspections and an "F.F.I." in the Army are not ranked among the highest peaks of achievement in our profession, but I have not yet heard it suggested that these should be delegated to nurses or orderlies. And what is the *ante-mortem* examination of animals intended for food but an F.F.I.? Incidentally the horse-leech differs from us in that the exclusive practice of his mysteries is secured to him by statute, and I am not sure if those who attempt to diagnose disease in the living animal without his direction do not risk a process at law.

When the pistol or knife has done its work, the problems of meat inspection are those of the *post-mortem* room. I have no doubt that many a mortuary porter can after a few years' service make an intelligent guess when he sees the organs lying on the slab. Large white lumps mean "cancer" and a bowel filled with blood "haemorrhage." But even while he helps a tyro to find an elusive adrenal he will probably admit that the pathologist knows more than he does. The pathologist's advantage lies not in visual memory or in having a book on the subject but in his training which began with the first lecture in physiology. To him *post-mortem* findings are not mere observations of fact to which he must fit a diagnosis of a sort, but illustrations of the dynamic reactions of the body to injury, infection, and old age. What seems bizarre he makes plain to all, and some minutia unseen by duller eyes throws him into miserable uncertainty. Although the fundamentals of pathology are as true in earthworms as in man, training and experience will make the pathologist more expert in some fields than in others. If he knows nothing of tropical medicine he will find the causes of death among Nigerians somewhat mysterious. If he tries his hand at a necropsy on an animal he will find the internal geography confusing, and when he has overcome this difficulty his ignorance of veterinary medicine will bring him back pretty sharply to first principles—and not much further. Only the other day I was brought a lump of tissue which at first glance I would have said was the liver of a three-bottle man which had been kept in formalin for many years. It was the lung of a piglet dead a few hours past whose infancy had been blighted but not terminated by a virus pneumonia. Did you ever hear of such a thing? Willy nilly, *post-mortem* diagnosis in biped and quadruped is linked in origin, in practice, and in common sense with the study of disease in the living: it cannot be otherwise.

You, Cobbleigh, have not only studied meat inspection but long ago satisfied the examiners by your knowledge of it. Take down your old text-book and browse in it; you will find it dry fodder for an inquiring mind. Can you plough through the stern dogmatism of those Levitican precepts without your mind thirsting for a cooling draught from "Muir" or "Topley and Wilson"? Even the text-books

* Dr. Hawke is here referring, we think, to the statement published in the *Brit. med J.*, May 22nd, 1954, suppl. p. 272; or perhaps *Lancet*, July 24th, 1954, p. 187.—Ed. L.

which the nurses use (and the less said of some of these the better) offer more tasty bait to him (or her) who would like a savour of reason added to the " Do " and " Do not." Don't let me tempt you to hurl your old book into the W.P.B. Inside its limits there is no better ; and the meat inspector who adds a knowledge of its contents to experience and observation and the words of his elders will seldom allow meat unfit to be eaten to reach the butcher's counter. It is on his strong shoulders, not on yours, that this ill-rewarded toil must fall and will continue to fall. He has gone to trouble and expense to fit himself for the task and he performs it with skill and proper pride. Since moribund animals seldom reach the abattoir, since the cause of death is usually only too plain, and since the diseases of animals communicable to man are relatively few, the meat inspector who knows his job will not often be in doubt whether a carcase is fit for food. His job will run as merry as a wedding bell until he meets something which is outside his experience and which is not in the book.

His duty is plain. It is to preserve the public health, and when in doubt he must condemn. One result of this is that a certain amount of meat which would harm no one is destroyed or degraded to subhuman uses. (If you doubt it, spend next market-day in the saloon bar of " The Crown " and listen to the gossip.) It is not, however, the waste of good provender which troubles me but a system which denies to most meat inspectors a benefit which even the wisest among us values—a " second opinion " close at hand.

Nothing pleases me more than trying to answer your bacteriological questions : I wish I did it better. When I am poggled in statistics to whom do I fly for enlightenment but to you ? Even Whiddon has been known to ask for advice above the umbilicus. Those who deny their need for such a harbour of refuge give us all a view of their capacities rather the reverse of what they intend. I suspect that the habit of increasing our skill and knowledge by picking the brains of wiser men is one of the things which marks off a craft or profession from mere " work." In this the meat inspector is like the rest of us. I know it because some of them come to ask my opinion when they are puzzled, and with regret I have to admit that I am no use to them because my knowledge of veterinary medicine is no more, perhaps less, than theirs. Since the diagnosis of disease in life and after death are complementary there is, in fact, no one trained to give a second opinion to the meat inspector but those who are registered with the R.C.V.S. It is an opinion whose value rests not so much on greater knowledge as on wider and deeper knowledge, which extends far beyond the covers of your little book.

There has been some foolish play with the fact that meat inspection plays a minor part in the veterinary syllabus compared with the many months of training demanded of the inspector. You might as well compare the hours spent on learning bandaging by the probationer nurse and him who would be a Master of Surgery. I do not pretend that all vets—the word was bound to slip out—have an equal skill or interest in these things. I doubt if you or I could open a whitlow nowadays. With special experience comes special interest, and, though I know it to be no more than a waking dream, I believe that a school of morbid anatomy might arise who could do for our veterinary colleagues what the Turnbullian school has done for us. They would have no reason to grumble at a shortage of material.

There is nothing novel in this idea. Many large abattoirs are under veterinary supervision, and to extend this to the country as a whole offers no great difficulty. After all it is not giving the orders and kowtowing to the boss that matter but the close and daily professional association. To make a real success of it I would ask for more laboratory services and more cold rooms for detention of carcases whose safety is doubtful ; but these are trimmings.

I am not much impressed when aldermen and councillors and professional associations tell us that there is nothing wrong with meat inspection to-day. It would be as true to say that very little proven damage to the public health results, and to this our national antipathy to eating raw meat contributes quite a lot. (There have been several recent outbreaks of trichinosis in those islands of barbarism where uncooked sausage meat on bread and butter is thought just the thing for tea.) I doubt if it matters whether ultimate responsibility for meat inspection lies with the Ministry of Agriculture or a local authority. All that I ask is that the rule-of thumb methods of your little book should be reinforced by the complementary scientific knowledge of the veterinary surgeon. Who pays and who controls I would think to be matters for reasonable adjustment—but then such things rather bore me.

Neither you nor I are likely to play any part in this controversy, and by the look of things our quiet and reasonable voices would be unheard. What shocked me was that doctors should reply to the considered argument of those whose training, tradition and loyalties are very like their own with a flat and uncompromising defence of the *status quo*. I find no matter of principle in all this for which anyone would trouble to go to the stake. What is at issue is the best method of protecting the public against hazards which are frankly of minor importance in the tables of the Registrar-General. On occasion we doctors pay some lip service to a well-balanced education and a training in the basic sciences. It is a pity not to use them in the service of preventive medicine when we can.

I reminded you, old Cobbleigh, that you once passed an examination in meat inspection. I have a saddle of mutton on which I shall value your opinion on Sunday next. Do not disappoint me.

Yours sincerely,

HARRY HAWKE.

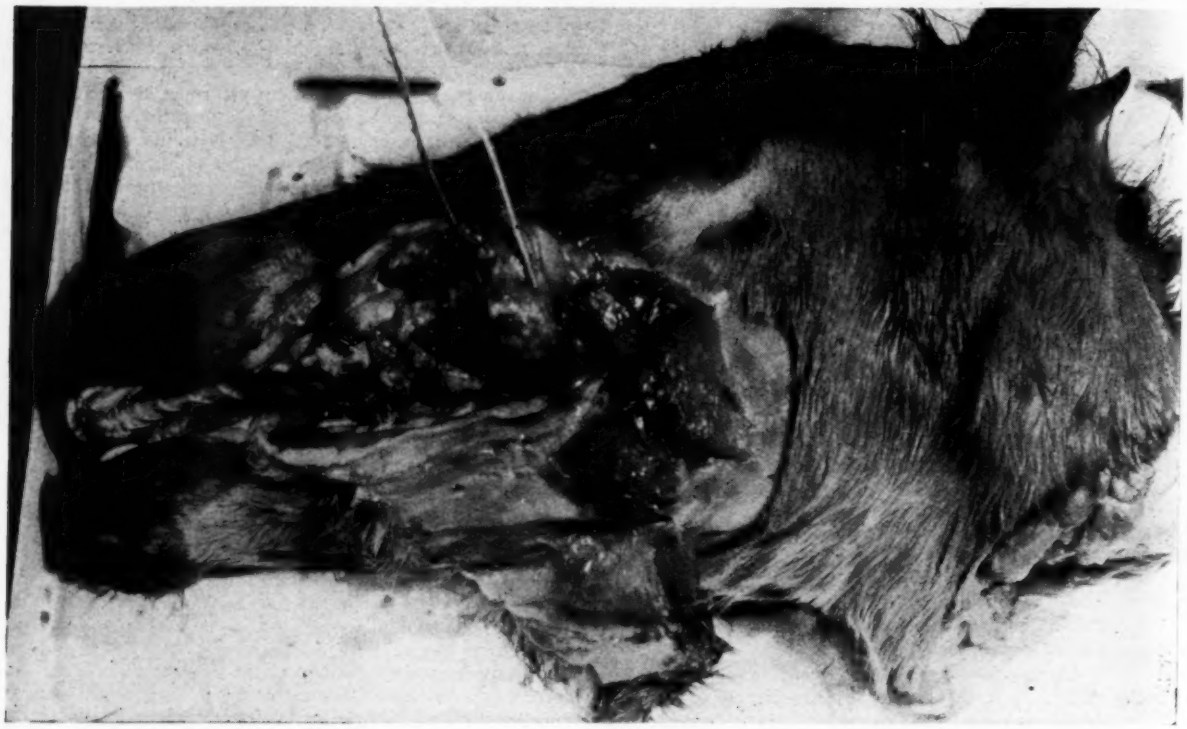
CLINICAL COMMUNICATION

CARCINOMA IN A TWO-MONTH-OLD THOROUGHBRED FOAL

P. J. MITCHELL

CHELMSFORD

On April 23rd last I was asked to examine a two-month-old thoroughbred filly foal. The animal was completely normal apart from a small swelling, the size of a large hazel nut, situated on the near side of the face, just superior to the second upper pre-molar. The swelling was in the gum, firm and unfluctuating. A diagnosis of a " gumboil " was given and appropriate treatment advised. When next seen, on April 28th, the swelling had enlarged to the size of a walnut and on palpation felt unchanged. Treatment was continued. On May 3rd the swelling had increased to the size of a tangerine, and suspicion of something more serious than had been diagnosed was aroused. On May 8th a series of X-ray plates at varying angles and varying exposures and intensities were taken, but these failed to show any dental or bony abnormalities, and by this time the swelling had become as large as a Jaffa orange, slightly lobulated to the touch, and seemed to be the cause of a most foetid odour coming from the mouth. Owing to the position of this lesion



it was almost impossible to see it, however one arranged the foal's head, as it lay slightly superior and lateral to the upper pre-molars and inside of the cheek.

At this stage it was decided to make an attempt to remove what appeared to be a tumour, so that it might be submitted for histological examination to determine its significance. The foal's general health throughout had remained excellent and the bodily condition good. On May 12th, after penicillin pre-medication, and very satisfactory nembutal anaesthesia, an attempt was made to remove the tumour. This proved to be no easy task and the haemorrhage involved was most considerable and seemed uncontrollable, being a general profuse seepage from the whole area. A portion of the tumour, about the size of a normal orange, was removed and submitted to the Department of Pathology, the Veterinary School, University of Cambridge, and a report returned as under :—

" *Report on Tissue received 13.5.54* (*J489*)

Gross and microscopic examinations of the tissues removed from the jaw of a foal revealed the swelling to be an ulcerated infected new growth. The tumour appears to be a carcinoma ; there are many downgrowths of epithelium and some free epithelial cells deep in the tissues. Mitotic figures are very plentiful in the epithelial cells indicating rapid growth of the tumour.

All the indications are that this is a malignant epithelial tumour and it is unlikely that surgical extirpation will be completely successful. A very guarded prognosis should be given."

Antibiotics were administered to the foal and the animal made a generally satisfactory recovery from the operation. However, by May 17th the swelling was increasing again and the foal was beginning to lose condition and develop the appearance of a generally sick animal. There was, however, no elevation of temperature and the foal continued to suck well although experiencing some difficulty in getting up and down. By May 21st, in view of the deterioration in condition and the increase in the size of the original lesion, it was decided to put down the foal and forward it to the pathologist for *post-mortem* examination. This was done with chloral hydrate, intravenously, and a *post-mortem* report and photograph were returned from the Pathology Department, as shown hereunder :—

" *Report on Foal received 22.5.54*

Post-mortem examination of the foal revealed a large ulcerated neoplasm on the left superior maxilla. The tumour was present on the gum margins and on the inner aspect of the cheek—it extended also on to the palate. The tumour was partially enclosing the molar teeth of that side. The new growth was friable, extensively ulcerated and had a very foul smell. The enclosed photographs show the type and extent of the lesion. Such a lesion would be inoperable.

The only other changes in the carcase worthy of note were present in the lungs. One area of the lung had an appearance which suggested early gangrene, this was probably due to aspiration of material from the mouth lesion. The remaining lung tissue was congested."

This case seemed of unusual interest to me, owing to the youth of the animal affected and the speed with which the lesion developed. I was assured by Mr. Wm. C. Miller that rapid development in the very young is normal with malignant neoplasms.

Acknowledgment.—I should like to acknowledge the interest shown in this case by Mr. Wm. C. Miller, Mr. E. Brayley Renolds and Mr. G. H. Leader, of Newmarket, and the advice they gave me ; the great help given by Mr. A. R. Jennings, of the Pathology Department, School of Veterinary Medicine, University of Cambridge ; and Mr. Negodaeff, of Newton Victor, Ltd., for his unstinted help and interest in the X-ray work of this case.

ABSTRACTS

Carriers of Swine Erysipelas*

Several Continental workers have shown that *Erysipelothrix rhusiopathiae* may be present in the organs of apparently normal pigs, and the author describes a survey made to ascertain the incidence of similar " carrier " pigs in this country.

A sample of red marrow was taken from a femur of each of 348 pigs, selected at random at a London slaughterhouse. These samples were examined by culture and by biological tests in mice and pigeons. By one cultural method, 34 of 204 samples (17 per cent.) yielded *Ery. rhusiopathiae*, but when a further 144 femurs were examined by a second, more sensitive, cultural method, 76 (53 per cent.) were positive. Many of the strains isolated were in the rough phase and were of reduced pathogenicity for mice and pigeons.

It has been stated that in some herds the only clinical manifestation of erysipelas infection has been a retardation of growth in young pigs and the author wonders to what extent the effect of feeding antibiotics to pigs may be due to their action on such infections. He also suggests that it is possible that the inoculation of " carrier " pigs with avirulent or attenuated vaccines which do not require the simultaneous use of antiserum might reactivate the latent infection and give rise to the clinical form of the disease. In the serum-culture method of vaccination the protective effect of the serum would probably prevent such a reactivation.

E. A. G.

* **Carriers of Swine Erysipelas.** Spears, H. N. (1954). *J. comp. Path.* **64.** 152–156.

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Control of Swine Fever*

Swine fever was declared a notifiable disease in 1879 but the power given to local authorities to enforce restrictions, to slaughter affected pigs, etc., did not effect a reduction in the number of outbreaks, and under the " Diseases of Animals " Acts of 1894 the Board of Agriculture assumed responsibility. From this time the policy of general slaughter was replaced by slaughter of affected animals or animals for diagnosis.

Following the recommendation of a Departmental Committee set up in 1910 further limited trials were made on the basis of total slaughter of all pigs in the infected and in-contact premises. No appreciable improvement resulted, however, and the policy was abandoned in 1915.

An interesting table is included which shows that during the 24 years up to 1938 an average of 1,500 outbreaks occurred a year, as compared with an average of 2,650 occurring annually during the 21 years that the wholesale slaughter policy was in force.

It is interesting to note that marked fluctuations have occurred subsequently in both directions without any change in policy. The disease still shows a summer increase and a winter decline which is thought to be due to a change in the character of the virus, a finding which is consistent with experience in relation to other contagious, virus diseases.

Complete eradication is made difficult by an incubation period which may be as long as 30 days, the low incidence of diagnostic lesions and the frequent occurrence of an extremely mild form reflected in slight ill health, unthriftiness and recovery. Carriers may also be a complicating factor. As the author remarks these features make the disease more difficult to control than foot-and-mouth disease.

The importation of the disease and the distribution via the swill tub is an added hazard. The virus can remain active in frozen pork for 1,500 days and in bacon for 27 days.

The fall in the number of outbreaks from 1940 to the lowest on record, namely, five in 1949, corresponds with the period of minimal imports of pig products and a marked decrease in the pig population in the United Kingdom.

The disease appeared in Ireland in 1942 on the arrival of U.S. Forces bringing their own food supplies. By the same manner it appeared in New South Wales in 1942 after 14 years' freedom, and Morocco and many other Mediterranean countries suffered likewise.

The rest of the article deals with the Crystal Violet vaccine first investigated by American workers in 1936. This contains the causal virus in an inactivated form and gives a strong protection for at least 12 months. On no account should unhealthy pigs, no matter what the cause, be vaccinated.

This is a very interesting and readable review.

N. S. B.

* **Progress in the Control of Swine Fever.** Claxton, B. A. (1954). *Agriculture, Lond.* **60.** 473–478.

NOTES AND NEWS

Diary of Events

Aug. 25th.—Meeting of the Southern Counties Division, B.V.A., at the Crown Hotel, Blandford, Dorset, 6 p.m.

Aug. 27th.—Summer Meeting of the Eastern Counties Division, B.V.A., at the Red Lion Hotel, Colchester, 11.45 a.m.

Aug. 31st.—Meeting of the Editorial Committee, B.V.A., at 7, Mansfield Street, W.1, 2.30 p.m.

Sept. 1st.—Meeting of the North Wales Division, B.V.A., at the Council Chambers, Town Hall, Ruthin, 2 p.m.

Sept. 19th—25th.—72nd Annual General Meeting and Congress of the British Veterinary Association at Torquay.

Nov. 16th & 17th.—B.V.A. Conference on the Feeding of Farm Livestock for Health and Production in the South Hall, Victoria Halls, Bloomsbury Square, London, W.C.1.

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PERSONAL

Mr. Roy Kenneth Claydon, M.R.C.V.S., of Rayleigh, Essex, has been appointed to the Colonial Veterinary Service as a Veterinary Officer in Nyasaland. He will sail from the United Kingdom on the s.s. *Rhodesia Castle* on September 2nd, 1954. He has served previously at Shrewsbury and at Torquay.

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DECORATION FOR MAJOR A. A. KIDD

The Queen has been graciously pleased to confer the award of the Territorial Efficiency Decoration upon Major A. A. Kidd of the Royal Army Veterinary Corps.

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RETIREMENT OF MR. P. F. DOLAN

His many friends in Britain will hear, with regret, of the retirement of Mr. P. F. Dolan, M.R.C.V.S., D.V.S.M., Chief Veterinary Inspector and Superintendent of Abattoir to the Dublin Corporation. He has given 41 years service.

Mr. Dolan, who has been an outstanding personality in the profession during the first half of this century, was educated at Castleknock College and qualified at the Dublin Veterinary College in July 1911. After spending some time in practice with the late Mr. Ward, of Manchester, he entered the service of the Dublin Corporation in 1913. In June, 1923, he obtained the diploma in Veterinary State Medicine at Edinburgh, being the first from Ireland to obtain this diploma.

In 1922, on the death of Mr. Andrew Watson, Mr. Dolan was appointed Chief Veterinary Inspector to the Dublin Corporation, which position he filled with distinction for a period of 32 years. Mr. Dolan devoted himself very enthusiastically to the many problems associated with the inspection of the meat and milk supply of this large city. He adopted a standard of meat inspection based on the Scottish regulations and later the Veterinary Inspection Order of 1929 legalised a national system of inspection which was in fact similar to that being operated by the Dublin Corporation. He was also a pioneer in the advocacy of highest grade milk and the establishment of tubercle free herds, and also introduced the systematic inspection of pigs in the Dublin bacon factories. On the experience gained by this inspection the regulations laid down under the Fresh Meat Act of 1930 were framed.

Many members of the profession, anxious to gain experience in veterinary public health work for the D.V.S.M. degree and public authority appointments, spent some time under Mr. Dolan's guidance, and veterinarians in prominent posts both at home and in various parts of the world to-day look back with high appreciation of the material help afforded them by their experience in the Dublin Corporation, Veterinary Department.

In addition to all his other duties, Mr. Dolan took a very active interest in the government and advancement of his profession. He has been a life-long member of the Veterinary Medical Association, of which body he was appointed President in 1926. He was one of the appointed members on the foundation of the Veterinary Council of Ireland in 1930, and was re-elected by the members of the profession until his resignation in 1951. He was President of the Council during the three years 1936-1938. Mr. Dolan represented his Association at meetings of the National Veterinary Medical Association (the B.V.A.) in Great Britain, and as General Elected Member from Northern Ireland attended the meetings of the Royal College in London.

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A LEGITIMATE GRIEVANCE

We are obliged to a member of the profession for permission to print extracts from a client's letter dealing with a topic of concern to all those engaged in small-animal practice. It appears that the veterinary surgeon expressed the view that the public are too ready to make use of the profession in times of emergency, while patronising the animal welfare clinics at other times. The client wrote as follows:—

Your argument that the public in time of need is apt to turn to the private veterinary surgeon as a last resort, rather than a first, is indisputable, and during the last day or so I have engaged in an abbreviated " Gallup Poll " in an attempt to gain some light on a proper apportionment of blame. I asked several people to whom they would go were their animals ailing. Most of them replied " To an animals' clinic." My informants did not belong to that class which would be motivated by reasons of economy. At this point I may mention that my own wife has done a fair amount of charitable work for animal clinics and that when we have taken our animals to one of them have paid *at least* as much as would have been asked by a private veterinary surgeon.

Afterwards I put your point of view to the people whom I had questioned: they did not deny its justice. Some of the points they made were:—

Animal institutions have their flag days and public appeals for funds which bring them prominently to the public eye and create the impression of a " deserving cause." Thus, when an animal is taken ill the first reaction on the part of the owner tends to be—" Here is an opportunity to kill two birds with one stone—get relief for the animal and contribute—sometimes handsomely—to a deserving charity for value received."

When one does not know the whereabouts of a veterinary surgeon and does know the whereabouts of an animal clinic, it is natural to choose the latter, in case of need.

The public, in seeking medical attention for their own ailments, cannot receive hospital treatment, except as casualties, save as holders of a letter from their doctor. The National Health system forces them to discover a medical practitioner for themselves. The private veterinary surgeon enjoys the benefit of no such machinery to bring " patients " to his door.

NATIONAL PIG RECORDS

A country-wide scheme of National Pig Records will start in England and Wales in September. It will absorb the two existing pilot schemes based on the Bucks Agricultural Executive Committee offices and the Harper Adams Agricultural College. Details of how to join will be announced shortly. The most important problem facing the pig industry to-day is how to improve the quality of pigs for bacon and pork and reduce costs of production. Pig recording is an essential means to this end.

The objects of the scheme are to encourage improvement in the standard of pig husbandry; and to assess the productivity of sows and boars by recording their progeny.

A committee has been appointed to advise on the development and running of the scheme; its membership includes Dr. John Hammond, of the School of Agriculture, Cambridge; Mr. W. T. Price, Principal of the Harper Adams Agricultural College; Mr. D. S. Davies, Principal of the Glynllifon Agricultural Institute, Caernarvon; Mr. A. S. Foot, of the National Institute for Research in Dairying; Mr. T. Gollins, a well-known Buckinghamshire pig breeder, and representatives of the National Farmers' Union and the National Pig Breeders' Association. At first the scheme will be run by the Ministry of Agriculture, but it has been so designed that it could be taken over by the industry when a suitable opportunity occurs.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Ches.—Eardswick Hall Farm, Minshull Vernon, Nantwich (Aug. 14).
Cumberland.—Miil Farm, Calderbridge (Aug. 13).
Norfolk.—Malthouse Farm, West Beckham, Holt (Aug. 11).
Northants.—Southview Farm, Wellingborough (Aug. 11).
Notts.—Mink Farm, Smallholding, Chesterfield Road, Hathwaite (Aug. 13).
Yorks.—Low Hall Farm, Horsforth, Leeds (Aug. 14).

FOWL PEST:

Essex.—The Elms, Bulpham, Upminster (Aug. 10).
Leics.—41, Holding, Land Settlement, Elmesthorpe (Aug. 11).
Sussex.—Plot I & J, Lottbridge Drove, Eastbourne (Aug. 12).

SWINE FEVER:

Ches.—Windmill Farm, Carden, Malpas (Aug. 9).
Devon.—5 Acre Field Smallholding, Exeter Road, Topsham, Exeter; Spencecombe, Crediton (Aug. 9); Portworthy Farm, Shaugh Prior, Plymouth; Wilsons Farm, East Worlington, Crediton; " Fernwood," Tedburn St. Mary, Exeter (Aug. 13).
Essex.—Nelson Farm, Nelson Road, Rayleigh (Aug. 9); Bigods Farm, Great Dunmow (Aug. 12).
Glamorgan.—Dan-y-Bryn Farm, Treforest, Pontypridd (Aug. 9).
Gloucs.—Elm Tree Farm, Frocester, Stonehouses (Aug. 9); Spoonbed Farm, Painswick, Stroud (Aug. 10).
Herts.—Rowley Bank Farm, Arkley, Barnet (Aug. 11).
Monmouth.—St. Julians Wood, Newport (Aug. 9).
Norfolk.—New Farm, Buxton Road, Frettenham, Norwich (Aug. 12); The Hall Farm, Stratton Strawless, Norwich (Aug. 14).
Notts.—Station Farm, Bleasby (Aug. 13).
Salop.—1, Workhouse Cottage, Chirbury (Aug. 9).
Staffs.—The Bungalow, Norrington Lane, Whittington, Lichfield (Aug. 10).
Suffolk.—The Post Office, Chediston, Halesworth (Aug. 9); Home Farm, Parham, Woodbridge (Aug. 11).
Sussex.—Bruce Cottage, Snow Hill, Crawley Down, Crawley (Aug. 10).
Warwicks.—Gables Farm, Claybrook, Ruby (Aug. 9); 13, George Street, Stockton, Rugby (Aug. 13).
Westmorland.—Oaks Farm, Ambleside (Aug. 9).
Wilts.—Manor Farm, Teffont Magna, Salisbury (Aug. 13).

To be completed and sent to the General Secretary, B.V.A., NOT LATER THAN SEPTEMBER 11th, 1954

TORQUAY CONGRESS, 1954

(September 19th to 25th)

FORM OF APPLICATION FOR TICKETS

ITEM	Number of tickets required	Cost per ticket	Total cost £	s.	d.	For office use
Sunday, September 19th						
8 p.m. "At Home" given by Western Counties Division ...	.....	Free	—	—	—	
Monday, September 20th						
8.30 p.m. Civic Reception and Dance	.....	Free	—	—	—	
Tuesday, September 21st						
9.30 a.m. Visit to Dartingdon Hall. (For *members*, ticket includes journey, lunch and tea)	.....	15s. 0d.				
(For *ladies*, ticket includes journey and tea)	.....	10s. 6d.				
8.30 p.m. Ladies' Guild Dance	.....	£1 1s.				
Wednesday, September 22nd						
7 p.m. Annual Banquet, with dancing to follow		£1 5s. (including gratuities)				
Please give names of those with whom, if possible, you would like to be seated						
.....						
.....						
Thursday, September 23rd						
Visit to theatre. (50 seats are booked at The Pavilion for the "Fol-de-Rols." Vouchers will be sent to first applicants) ...	.....	6s. 0d.				
Friday, September 24th						
8.30 p.m. President's Reception and Dance	.....	Two tickets may be had free; additional tickets 15s. each	—	—	—	
Other Requirements						
Congress Badge. (This will be required to obtain free entry to certain places, *e.g.*, hotel dance)	.....	3s. 6d.				
Corporation facility card	.....	Free	—	—	—	
Corporation car park voucher. (At Corporation sites only.)	.....	Free	—	—	—	

£_____

To: The General Secretary,
B.V.A., 7, Mansfield Street, Portland Place, London, W.1.

Please send tickets, etc., indicated above. I enclose £ : : to cover the cost.

Name (block letters, please)..... Qualifications.....

Address to which tickets, etc. should be sent.....

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B.V.A. Annual Congress at Torquay—September 19th to 25th, 1954

Programme

N.B.—All meetings will take place in Torre Abbey unless otherwise stated.

SUNDAY, SEPTEMBER 19th

8.00 p.m.
"At Home," given by the Western Counties Division, B.V.A. at the Palace Hotel.

MONDAY, SEPTEMBER 20th

10.00 a.m.
Civic Welcome by His Worship the Mayor of Torquay followed by opening of Congress by the Rt. Hon. the Earl Fortescue, K.G., P.C., C.B., O.B.E., M.C.

10.30 a.m.
Opening of Exhibition of Surgical Instruments, Drugs, etc., by the President, B.V.A. (Spanish Barn, Torre Abbey).

12 noon
Films, including "Semen Collection in the Boar," "Phagocytosis," and clinical films.

1.00 p.m. LUNCHEON

2.30 p.m. *Main Hall*
Paper : "Meat Inspection Abroad," by Mr. Horace Thornton, B.V.Sc., M.R.C.V.S., D.V.H. (Newcastle upon Tyne).
Openers : Mr. L. N. Thornton (Commonwealth Veterinary Officer, Australia House).
Mr. C. V. Dayus, M.R.C.V.S. (Agricultural Liaison Officer to the High Commissioner for New Zealand);
Lieut.-Colonel Rolland O. Scott (U.S.A.F. (V.C.));
Dr. Orlan Hall (Canada).

8.30 p.m.
Civic Reception and Dance, given by the Mayor and Corporation of Torquay in the Marine Spa.

TUESDAY, SEPTEMBER 21st

9.30 a.m.
Coaches for members depart from Torwood Street Garage, Torquay, for Dartington Hall.

10.00 a.m. View Cattle Breeding Station
11.00 a.m. View Parsonage Farm
12 noon View Barton Farm
} In three groups.

1.00 p.m. LUNCHEON

2.00 p.m.
Coaches for ladies depart from Torwood Street Garage for Dartington Hall.

2.30 p.m.
Paper : "Present Position with Regard to Bovine Mastitis and a Review of Recent Trials of Various Antibiotics for Bovine Mastitis," by Mr. C. D. Wilson, M.R.C.V.S. (Weybridge).
Opener : Mr. J. D. Dunn, M.R.C.V.S. (Wadebridge).

4.30 p.m. TEA, which ladies are invited to join.

5.30 p.m.
Coaches return to Torquay.

2.30 p.m. *For those remaining in Torquay*
Films in Main Hall, Torre Abbey. (Repeat of Monday's showing.)

8.30 p.m.
Ladies Guild Dance at Palace Hotel.

WEDNESDAY, SEPTEMBER 22nd

10.00 a.m. *Main Hall*
Paper : "Myxomatosis," by Mr. J. N. Ritchie, B.Sc., M.R.C.V.S., D.V.S.M. (Tolworth), in collaboration with Mr. J. R. Hudson, B.Sc., M.R.C.V.S. (Weybridge) and Mr. H. V. Thompson, B.Sc. (Tolworth).
Opener : Professor R. E. Glover, M.A., B.Sc., F.R.C.V.S. (Liverpool).
Break for coffee in Exhibition Hall (Spanish Barn)
Followed by *Paper :* "X-ray in Clinical Diagnosis," by Lieut.-Colonel J. Hickman, M.A., M.R.C.V.S. (Cambridge).
Opener : Lieut.-Colonel R. C. Crowhurst, O.B.E., M.R.C.V.S. (Newmarket).

10.00 a.m.
A.G.M. of Ladies' Guild in the Lounge, Torre Abbey.

11.00 a.m. *Small Hall (Adam Room)*
Paper : "The Prevention of Enterotoxaemias of Sheep," by Dr. R. F. Montgomerie, B.Sc., F.R.C.V.S., and Mr. A. Thomson, M.R.C.V.S. (Beckenham).
Opener : Mr. D. Harkness, M.R.C.V.S. (South Molton).

12 noon
Meeting of 1953–54 Council, B.V.A. (Lounge).

1.00 p.m. LUNCHEON

2.15 p.m.
A.G.M. of Association of Veterinary Teachers and Research Workers in the Adam Room, Torre Abbey.

2.30 p.m.
Congress Photograph at Torre Abbey.

3.00 p.m.
Annual General Meeting (Main Hall).

7.00 for 7.30 p.m.
Annual Banquet, with Dancing to follow, at the Palace Hotel.

THURSDAY, SEPTEMBER 23rd

10.00 a.m. *Main Hall*
Paper : "Present Disease Position in the Poultry Industry," by Dr. R. F. Gordon, M.R.C.V.S. (Houghton, Hunts).
Openers : Dr. W. P. Blount, F.R.C.V.S. (London), and Mr. John Reid, M.R.C.V.S., D.V.S.M. (Tolworth).

10.00 a.m. *Small Hall (Adam Room)*
Paper : "Fungoid Infections in Animals," by Dr. G. C. Ainsworth, B.Sc. (Exeter).
Opener : Mr. C. V. Watkins, M.R.C.V.S., D.V.S.M. (Starcross).
Break for coffee in Exhibition Hall (Spanish Barn)

12 noon or immediately following previous paper, *Main Hall*
Paper : "Summary of the Known Functions of the Adrenal Gland," by Mr. J. L. McGirr, B.Sc., M.R.C.V.S. (Weybridge).
Opener : Dr. W. R. Kerr, B.Sc., M.R.C.V.S., D.V.S.M. (Belfast).

1.00 p.m. LUNCHEON

2.30 p.m.
Films, Golf, Tennis, Bowls, etc.

6.00 p.m.
Glasgow Alumnus Dinner at the San Remo Hotel.

6.15 p.m.
Royal (Dick) Alumnus Dinner at the Queen's Hotel.

8.00 p.m.
Theatre bookings have been made at The Pavilion.

FRIDAY, SEPTEMBER 24th

10.00 a.m. *Main Hall*
Short Papers : "Pig Rearing," by Mr. J. W. Reid, N.D.A. (Starcross); "Pig Nutrition," by Dr. D. E. Tribe, B.Sc. (Bristol); "Pig Diseases," by Mr. H. F. Hebeler (Langport).
Opener : Professor F. Blakemore, D.V.Sc., B.V.Sc., M.R.C.V.S., D.V.S.M. (VICT.) (Bristol).
Break for coffee in Exhibition Hall (Spanish Barn)

11.00 a.m. *Small Hall (Adam Room)*
Paper : "Neoplasia in the Dog," by Mr. E. Cotchin, M.R.C.V.S. (London).
Opener : Mr. J. Allcock, B.V.Sc., M.R.C.V.S. (Bristol).

1.00 p.m. LUNCHEON

2.30 p.m. *Main Hall*
Paper : "Scientific Trends in Milk Production in Great Britain" (with colour film of production methods and research in New Zealand), by Dr. Joseph Edwards (Milk Marketing Board).
Opener : Mr. John R. Currie, M.S., B.Sc., N.D.A., N.D.D. (Dartington Hall).

2.30 p.m. *Small Hall (Adam Room)*
Paper : "Hereditary Conditions in the Dog," by Dr. G. B. Young, M.R.C.V.S. (Edinburgh).
Opener : Miss J. O. Joshua, F.R.C.V.S. (Finchley).

8.30 p.m.
President's Reception and Dance at the Palace Hotel.

SATURDAY, SEPTEMBER 25th

10.00 a.m. *Main Hall*
Closing Meeting of Congress, followed by First Meeting of Council, 1954–55.

The Ministry of Agriculture Exhibit of Specimens of Poultry Diseases and Myxomatosis will be in the Print Room, Torre Abbey throughout Congress Week